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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/814,904 | 03/30/2004 | Satoshi Umemura | 5000-5162 | 6329 |

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| EXAMINER | |
|---|---|
| FIELD, LINDA PENA | |
| **ART UNIT** | **PAPER NUMBER** |
| 2855 | |

DATE MAILED: 09/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H·A

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/814,904 | UMEMURA ET AL. | |
| | Examiner | Art Unit | |
| | Linda P. Field | 2855 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1, 2, 5-7, 9-11 and 13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rhodes (5952587) in view of Gombocz (4372172).

With respect to Claim 1, Rhodes discloses a supporting member (support structure, Column 3, line 6), a bearing attached to the supporting member (bearing 34, Column 3, line 17), a rotor rotatably supported by the supporting member with the bearing in between (outer periphery of the outer race 38), a deformation member located between the supporting member and the bearing (interior periphery of inner race 40, Column 3, line 23), a deformation detection device wherein the deformation detection device detects the deformation amount of the deformation member at two or more positions that are spaced from each other in a circumferential direction of the bearing (sensors 44 are spaced about the interior periphery of inner race 40, Column 3, lines 23), and a computer (steps 1-6, Figure 9). Rhodes however lacks the power transferring member being engaged with the rotor. Gombocz teaches the process for measuring the tightness of endless driving means. Gombocz further illustrates that measuring can be performed by means of strain gauges, spring actuated, or hydraulic, piezoelectric crystalled, or inductive dynometers. These indirect methods enable the

estimation of the tightness of the driving means (belts, chains, etc.) or of the changes thereof. (See Column 1, lines 5-20). To employ a power transferring member with a rotor and a computer that computes the tension of the power transferring member to measure the tightness of endless driving means in light of Gombocz would have been obvious to one of ordinary skill in the art as taught by Rhodes.

2. With respect to Claim 2, Rhodes teaches a deformation detection device that includes a pair of deformation sensors (sensors 44).

3. With respect to Claim 5, Rhodes teaches a bearing as a roller bearing including an inner race, an outer race, and rolling bodies located between the races and the deformation member is located between the supporting member and the other one of the inner and outer race (the bearing 34 includes rolling elements 42 which are spaced between the outer race 38 and inner race 40, Column 3, line 16; and one embodiment has sensors disposed about outer race 38 and another embodiment has sensors disposed about the inner race 40, Column 3, lines 30-42).

4. With respect to Claim 6, Gombocz teaches a deformation member and the deformation detection device are provided at the drive source (a method of measuring the tightness or driving means whereby the supporting force of the bearing holding the shafts of the driving drum, drive sprocket, etc. taking up the endless driving means is measured, Column 1, lines 5-19).

5. With respect to Claim 7, Gombocz teaches a rotor that includes a pulley that is coupled to a rotary shaft of the driven device such that the pulley rotates integrally with the rotary shaft, wherein the power transferring member is engaged with the pulley ( in

the measuring system according to Figure 1, the endless driving means 18 is driven by a driving drum 10, and about a deflecting pulley 12, a tightening drum 16 and a reverse drum 14, the driving means is advancing in the direction indicated by the arrow with a speed v, Column 2, lines 50-58).

6. With respect to Claim 9, Gombocz teaches a deformation member and the deformation detection device are provided at the drive source (a method of measuring the tightness or driving means whereby the supporting force of the bearing holding the shafts of the driving drum, drive sprocket, etc. taking up the endless driving means is measured, Column 1, lines 5-19).

7. With respect to Claim 10, Gombocz teaches a power transferring member engaged with an idle pulley and the idle pulley functions as the rotor (driving means 18 engaged about a deflecting pulley 12).

8. With respect to Claim 11, Rhodes discloses a deformation member located between the housing and the bearing (interior periphery of inner race 40, Column 3, line 23), a deformation detection device wherein the deformation detection device detects the deformation amount of the deformation member at two or more positions that are spaced from each other in a circumferential direction of the bearing (sensors 44 are spaced about the interior periphery of inner race 40, Column 3, lines 23), and a computer (steps 1-6, Figure 9).

9. With respect to Claim 13 Rhodes teaches a deformation member as a tolerance ring (a system for sensing rolling element loads in a rolling element bearing having a

plurality of rolling elements disposed between an inner race and an outer race thereby functioning as a tolerance ring is illustrated, Column 2, lines 5-15).

10. With respect to Claim 14, Rhodes discloses a supporting member (support structure, Column 3, line 6), a bearing attached to the supporting member (bearing 34, Column 3, line 17), a rotor rotatably supported by the supporting member with the bearing in between (outer periphery of the outer race 38), a deformation member located between the supporting member and the bearing (interior periphery of inner race 40, Column 3, line 23), a deformation detection device wherein the deformation detection device detects the deformation amount of the deformation member at two or more positions that are spaced from each other in a circumferential direction of the bearing (sensors 44 are spaced about the interior periphery of inner race 40, Column 3, lines 23), and a computer (steps 1-6, Figure 9).

11. With respect to Claim 15, Gombocz teaches a power transferring member transfers the torque to a driven device, wherein the driven device is located adjacent to the drive source and in the trailing section (the endless driving means 18 is driven by a driving drum 10, and about a deflecting pulley 12, the driving means is advancing in the direction indicated by the arrow with a speed v, Figure 1, Column 2, lines 50-57).

12. With respect to Claim 16, Rhodes teaches a deformation member as a tolerance ring (a system for sensing rolling element loads in a rolling element bearing having a plurality of rolling elements disposed between an inner race and an outer race thereby functioning as a tolerance ring is illustrated, Column 2, lines 5-15).

13. With respect to Claim 17, Gombocz teaches a power transferring member engaged with an idle pulley and the idle pulley functions as the rotor (driving means 18 engaged about a deflecting pulley 12).

14. With respect to Claim 18, Rhodes teaches a deformation member as a tolerance ring (a system for sensing rolling element loads in a rolling element bearing having a plurality of rolling elements disposed between an inner race and an outer race thereby functioning as a tolerance ring is illustrated, Column 2, lines 5-15).

15. With respect to Claim 19, Gombocz teaches a deformation member and the deformation detection device are provided at the drive source (a method of measuring the tightness or driving means whereby the supporting force of the bearing holding the shafts of the driving drum, drive sprocket, etc. taking up the endless driving means is measured, Column 1, lines 5-19).

16. With respect to Claim 20, Rhodes teaches a deformation member as a tolerance ring (a system for sensing rolling element loads in a rolling element bearing having a plurality of rolling elements disposed between an inner race and an outer race thereby functioning as a tolerance ring is illustrated, Column 2, lines 5-15).

17. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joki (6490935 B1) in view of Gombocz.

With respect to Claim 1, Joki discloses a supporting member (housing C, Column 1), a bearing attached to the supporting member (bearing A1, A2, A4 and A7, Column 2, lines 8-15), a rotor rotatably supported by the supporting member with the bearing in

between (shaft B, Column 2, lines 1-5), a deformation member located between the supporting member and the bearing (interior periphery of the inner race in the form of a cone 2, Column 8), a deformation detection device wherein the deformation detection device detects the deformation amount of the deformation member at two or more positions that are spaced from each other in a circumferential direction of the bearing (groove 84 creates an unsupported bean 86 in the cone 2 and contains a strain sensor 88), and a computer (the rotating race or the rotating component on which the rotating race is mounted is fitted with a computer, the computer collects information from sensors on the rotating race and stores that information, it also stores that information relating to calibration and identification of the bearings, on the other hand, the computer could be coupled inductively to the fixed race to transfer power to it and signals from it, Column 8, lines 29-39). Joki however lacks the power transferring member being engaged with the rotor. Gombocz teaches the process for measuring the tightness of endless driving means. Gombocz further illustrates that measuring can be performed by means of strain gauges, spring actuated, or hydraulic, piezoelectric crystalled, or inductive dynometers. These indirect methods enable the estimation of the tightness of the driving means (belts, chains, etc.) or of the changes thereof. (See Column 1, lines 5-20). To employ a power transferring member with a rotor and a computer that computes the tension of the power transferring member to measure the tightness of endless driving means in light of Gombocz would have been obvious to one of ordinary skill in the art as taught by Joki.

18. With respect to Claim 2, Joki teaches a deformation detection device that includes a pair of deformation sensors (the cup 4 flexes enough at its beams 36 to enable the flexure to be detected by strain sensor, Column 3, lines 11-18).

19. With respect to Claim 3, Joki teaches a deformation member being an annular member having a plurality of curved portions, wherein the curved portions protrude radially outward and are arranged in a circumferential direction of the annular member, and wherein the deformation sensors are each located in one of spaced two of the curved portions (the cone 2 is proved with a groove 84, which is similar to the groove 34, it has the same arcuate cross section as the groove 34 and extends the full length of the cone 2 while maintaining uniform depth, the groove 84 creates an unsupported beam 86 in the cone 2 and contains a strain sensor 88 which is oriented to detect expansions and contraction in the circumferential direction, Column 8, lines 5-13).

20. With respect to Claim 4, Joki teaches a deformation member as a tolerance ring (a system for sensing rolling element loads in a rolling element bearing having a plurality of rolling elements disposed between an inner race and an outer race thereby functioning as a tolerance ring is illustrated, Column 8, lines 1-28).

22. Claims 8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rhodes (5952587) in view of Gombocz and further in view of Matsui (Japan Patent 07-331650).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rhodes in view of Gombocz as applied to claim 6 above, and further in view of Matsui (Japan

Patent 07-331650). Rhodes teaches the elements of Claim 1 and 6 but lacks a compressor. Matsui discloses the driven device is a compressor, including a gas compression mechanism driven by the rotor (an auxiliary torque detection system that provides accurate, reliable and durable measuring accuracy which utilizes a compressor pulley). To employ a real-time bearing load sensing system that computes the tension of the power transferring member to measure the tightness of endless driving means in light of Matsui would have been obvious to one of ordinary skill in the art as taught by Rhodes.

23. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rhodes in view of Gombocz as applied to claim 11 above, and further in view of Matsui (Japan Patent 07-331650). Rhodes teaches the elements of Claim 11 but lacks a compressor. Matsui discloses the driven device is a compressor, including a gas compression mechanism driven by the rotor (an auxiliary torque detection system that provides accurate, reliable and durable measuring accuracy which utilizes a compressor pulley). To employ a real-time bearing load sensing system that computes the tension of the power transferring member to measure the tightness of endless driving means in light of Matsui would have been obvious to one of ordinary skill in the art as taught by Rhodes.

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patents 5305648, 6535135 B1, 4909086,6061543 and 5305648 pertain to tension detection devices for endless loops.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Linda P. Field whose telephone number is 571-272-6001. The examiner can normally be reached on 7:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on 571-272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LPF

MAX NOORI
PRIMARY EXAMINER